

WCCF 77

**Simplicity
is the
ultimate
sophistication.**



**Introducing
Apple II,TM
the personal
computer.**

Sophisticated design



Apple II will change the way you think about computers. Compared to first generation "hobby" computers, Apple II is easier to use, faster, smaller and more powerful. It brings to personal computing a new level of simplicity through hardware and software sophistication. And Apple II can grow with you as your skill and experience with computers grows.

Sophisticated built-in features such as BASIC, the English-like programming language, advanced color graphics, and use of state-of-the-art high density memory components (16K ROMs and RAMs), set Apple II apart from all the others.

But you don't even need to know a ROM from a RAM to use and enjoy Apple II. Its beauty is in its simplicity. It's a complete, ready to use computer — not a kit. Everything is included. Hook it up to your color TV* and begin writing your own computer programs the very first evening. Even if you've had no

previous computer experience, you can invent your own color games, create artistic displays, or instruct Apple II to chart your home finances. Conversing with Apple II in BASIC is easy using its familiar typewriter-style keyboard.

Games have always been one of the most creatively challenging applications for the computer, and Apple II's sophistication shows through in the games it can help you create. Games like PONG or STARTREK. Apple BASIC contains advanced unique commands for using color graphics (COLOR=, PLOT, HLIN, VLIN, SCRIN) which means creating dazzling color displays or writing your own

PONG type game becomes something even a beginner can master. Since text can be displayed along with graphics, your program can keep score, give and accept instructions and even comment on your ability as a player. Paddles and joysticks are interfaced easily using the built-in Apple GAME I/O connector. And a special BASIC command (PDL) automatically senses the position of the paddle. That simplifies writing action games. Apple II's built-in speaker sounds when the ball is hit, and when



gn makes it simple.

a point is made or lost. In STARTREK, you'll actually hear the phasers and photon torpedoes.

Apple II will do more than entertain you. Playing with it, you'll begin to learn what a computer is all about and how rewarding it can be. You'll discover that it's easy to program your Apple II to do things like teach your kids arithmetic or spelling. (Yes, it's OK to let your kids use Apple II. It's ruggedly engineered and has a virtually unbreakable plastic case.) And you can save your programs on an ordinary cassette tape using the built-in cassette interface and your home cassette

recorder. Other sources of programs are the Apple software library and the Apple II owner down the block.



Increased memory can extend your horizons. For instance, with 12K or more memory, Apple II can generate a high-resolution (280h x 192v) graphic display in 4 colors useful for scientific, medical or artistic applications. The user memory can be expanded up to 48K bytes by simply inserting more memory packages in the sockets provided.

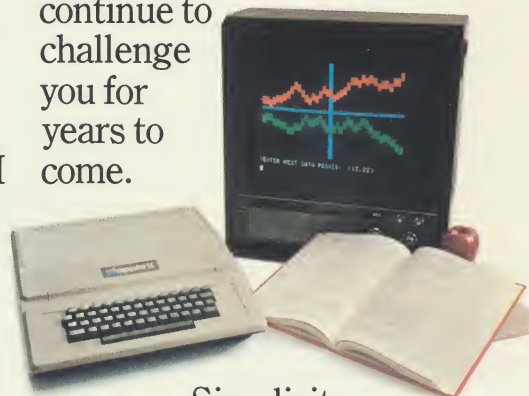
Also, there are several peripheral boards scheduled for introduction soon which will plug into the expansion connectors—Apple II

has eight built-in—enabling you to syn-

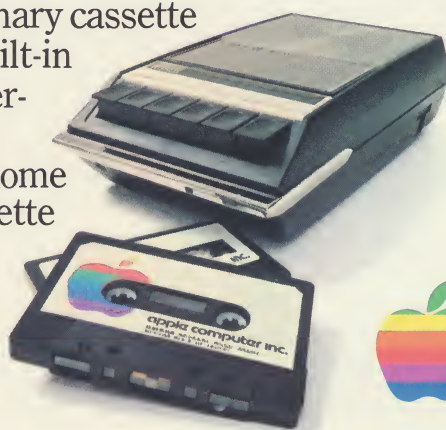
thesize music or talk to another computer over the phone. Many more interesting peripheral boards to expand your Apple II will be available this year.

As you become an expert, you'll grow to appreciate the sophistication inside Apple II. Its 2K byte ROM monitor contains a mini-assembler, a disassembler, single-step and trace routines, floating point package, a software-simulated 16-bit processor routine, and more.

Apple II is an advanced personal computer that will continue to challenge you for years to come.



Simplicity.
Sophistication. Apple II.



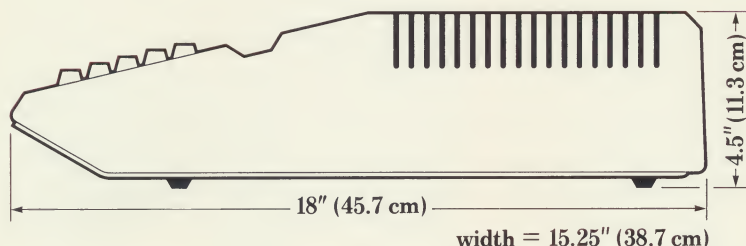
apple computer inc.TM

*Apple II plugs into a TV monitor or hooks up to any standard television using an inexpensive commercially available RF modulator (not supplied).

PONG is a trademark of Atari, Inc.

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Technical Overview



Apple II is a complete, self-contained, ready to use computer. Standard features include BASIC and Monitor in ROM (8K bytes), Color Graphics, up to 48K bytes RAM (4K included), cassette interface, Apple GAME I/O connector, typewriter-style ASCII keyboard, high-efficiency switching power supply and plastic molded case. Also included as standard are: 1 demonstration cassette tape, two game paddle controllers and detailed operations manual.

MICROPROCESSOR:

6502 operating at 1 MHz clock.

VIDEO DISPLAY

The Apple II video display section displays memory as either text, *color graphics*, or *high-resolution graphics* (completely transparent memory access). Both graphics modes can be selected to include 4 lines of text at the bottom of the display area. *All display modes are software selectable.* In addition, the user can select under software one of two memory blocks to be displayed.

Text

- 40 characters/line, 24 lines.
- 5 x 7 upper case characters.
- Normal, inverse or flashing characters.
- Extensive display control software in ROM.
- Full cursor control.
- Fast display — 1000 cps.

Color Graphics

- 40h x 48v resolution or 40h x 40v with 4 lines text.
- 15 colors — color generated digitally.
- BASIC commands to use graphics easily: COLOR=, PLOT x, y, HLIN, VLIN SCRN.

High Resolution Graphics

- 280h x 192v resolution or 280h x 160v with 4 lines text.
- 4 colors — black, white, violet, green.
- Displays 8K bytes (requires 12K minimum RAM).

MEMORY

RAM is organized into 3 increments. Each increment can be either 4K bytes using 4K chips or 16K bytes using advanced 16K chips. Memory may be easily increased by inserting an additional increment of chips. From 4K to 48K bytes of RAM can be contained on the single board. 8K bytes of ROM are supplied which permanently store Apple BASIC (6K) and a powerful system monitor (2K). Two additional ROM sockets are provided for future Apple software.

- Up to 48K bytes on-board RAM — no peripheral memory boards!
- Unique automatic RAM refresh system, completely transparent.
- Uses 4096, 2104 type 4K and 4116, 2116 type 16K RAMs.
- Fast memory — 350ns access time.

I/O

Apple II includes as standard an ASCII keyboard, audio cassette interface, 8 peripheral board connectors, speaker, Apple GAME I/O connector and two game paddle controllers.

- Reliable typewriter-style keyboard.
- Fast cassette interface — 1500 bps.
- Peripheral board connectors:
 - fully buffered busses & timing
 - Daisy-chained interrupt and DMA priority structure
- GAME I/O — 4 paddle inputs, 3 TTL inputs and 4 TTL outputs.

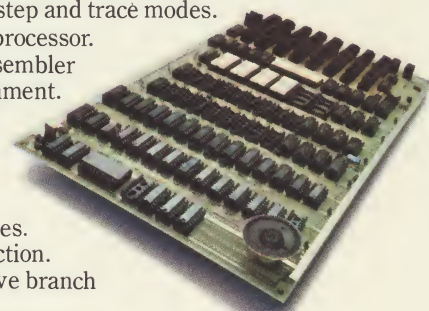
BASIC

Apple BASIC is an integer BASIC supplied in 6K bytes of ROM and includes the following features (in addition to normal basic features):

- Apple BASIC is a fast translated BASIC.
- Any length variable names (ALPHA, BETA\$).
- Syntax and range errors indicated immediately when entered.
- Multiple statements on one line.
- Integers from -32767 to +32767.
- String arrays to 255 characters. Single dimension integer arrays.
- Graphics Commands: COLOR=expr, PLOT, HLIN (draw horizontal line), VLIN, SCRN (x, y) (reads the screen color).
- Paddle read function: PDL (0-3).
- TEXT and Graphics Commands set display mode from BASIC.
- Immediate execution of most statements.
- Memory boundary adjust (does not destroy current program).
- Break and Continue program execution.
- Debug commands: line number trace and variable trace.
- Switchable I/O device assignments.
- Direct memory access: PEEK, POKE, CALL commands.
- Cassette SAVE and LOAD commands.
- Auto line number mode.
- RND, SGN, ASC, LEN and ABS functions.
- POP instruction pops the return stack one level.
- GOTO expr, GOSUB expr allowed.

MONITOR

- 2K byte ROM monitor.
- Screen control (intelligent display routines). Full cursor control.
- Scrolling window adjustable (protected screen feature).
- Software simulated single-step and trace modes.
- Software simulated 16-bit processor.
- Dis-assembler and mini-assembler
- Input/Output device assignment.
- Editing on keyboard entry.
- Floating point package.
- Breakpoint handling.
- Register examine/modify.
- Read/Write cassette routines.
- Inverse/Normal video selection.
- Hex add/subtract for relative branch calculations.



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Due to our continuing program of product improvement, specifications are subject to change without notice. Printed in U.S.A. 4/77

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Apple
Computer Inc.
**Suggested Retail
Price List**

Effective November 15, 1979



SUGGESTED PRICES APPLICABLE
IN U.S.A. ONLY

Apple System Packages for every application

| Description | Model No. | Suggested Retail Price |
|--|-----------|------------------------------|
| STARTER SYSTEM | | |
| Apple II Plus System — 16K RAM | A2S1016 | 1195.00 |
| Tape Recorder | A2M0018 | 40.00 |
| | | 1235.00 |
| STUDENT'S SYSTEM | | |
| Apple II Plus System — 32K RAM | A2S1032 | 1345.00 |
| Disk II Floppy Disk & Controller | A2M0004 | 595.00 |
| | | 1940.00 |
| SCIENTIST'S SYSTEM | | |
| Apple II Plus System — 48K RAM | A2S1048 | 1495.00 |
| Disk II Floppy Disk & Controller | A2M0004 | 595.00 |
| Communications Modem & Controller | A2M0017 | 390.00 |
| Video Monitor — 9" B & W | A2M0005 | 240.00 |
| Centronics μ P1 Printer & Controller | A2M0010 | 695.00 |
| Language System with Pascal | A2B0006 | 495.00 |
| | | 3910.00 |
| BUSINESS MANAGER'S SYSTEM | | |
| Apple II Plus System — 48K RAM | A2S1048 | 1495.00 |
| Disk II Floppy Disk & Controller | A2M0004 | 595.00 |
| Disk II Second Disk Drive | A2M0003 | 495.00 |
| Video Monitor — 9" B & W | A2M0005 | 240.00 |
| Centronics 779 Printer & Controller | A2M0011 | 1545.00 |
| The Controller — Gen'l Business Software | A2D0012 | 625.00 |
| | | 4995.00 |

| Description | Model No. | Suggested Retail Price |
|---|-------------------------|------------------------------|
| APPLE® II SYSTEMS | | |
| Apple II is a completely assembled and tested computer system. The system includes a rugged molded case, typewriter-style keyboard with N-key rollover, high-efficiency switching power supply, ROM-resident Integer BASIC interpreter, monitor, mini-assembler and disassembler; two hand controllers, demonstration programs on tape cassettes, AC power cord, cassette cable, reference manuals and BASIC Programming Manual. | | |
| 16K Bytes RAM | A2S0016 | 1195.00 |
| 32K Bytes RAM | A2S0032 | 1345.00 |
| 48K Bytes RAM | A2S0048 | 1495.00 |
| APPLE® II PLUS SYSTEMS | | |
| Apple II Plus is a completely assembled and tested computer system. The system includes a rugged molded case, typewriter-style keyboard with N-key rollover, high-efficiency switching power supply, ROM-resident Applesoft Extended BASIC interpreter, Auto-Start ROM, disassembler, two hand controllers, demonstration programs on tape cassettes, AC power cord, cassette cable, reference manuals and Applesoft Tutorial Manual. | | |
| 16K Bytes RAM | A2S1016 | 1195.00 |
| 32K Bytes RAM | A2S1032 | 1345.00 |
| 48K Bytes RAM | A2S1048 | 1495.00 |
| LITERATURE | | |
| 6502 Hardware Manual | A2L0002 | 15.00 |
| 6502 Programming Manual | A2L0003 | 15.00 |
| Apple II BASIC Programming Manual | A2L0005 | 6.95 |
| Apple II/II Plus Reference Manual | A2L0001A ^[2] | 20.00 |
| Applesoft II Reference Manual | A2L0006 | 10.00 |
| Applesoft Tutorial Manual | A2L0018 ^[2] | 10.00 |
| Best of Contact '78 | A2L0020 | 2.50 |
| Communications Interface Manual | A2L0007 | 2.00 |
| Consumer Guide to Personal Computers | A2L0015 | 2.00 |
| Disk II Floppy Disk Manual | A2L0012 | 10.00 |
| High-Speed Serial Interface Manual | A2L0008 | 2.00 |
| Parallel Printer Interface Manual | A2L0004 | 2.00 |
| Programmer's Aid #1 Manual | A2L0011 | 2.00 |
| INTERFACE CARDS | | |
| Applesoft II Firmware Card with Auto-Start ROM | A2B0009 | 200.00 |
| Centronics Printer Interface Card | A2B0007 | 225.00 |
| Communications Card & DB25 Connector Cable | A2B0003 | 225.00 |
| High-Speed Serial Interface Card | A2B0005 | 195.00 |
| Integer BASIC Firmware Card with Mon. & Prog. Aid ROMs | A2B0010 ^[2] | 200.00 |
| Language System with PASCAL (48K RAM & disk required) | A2B0006 | 495.00 |
| Parallel Printer Interface Card | A2B0002 | 180.00 |
| Prototyping/Hobby Card | A2B0001 | 24.00 |
| ACCESSORIES | | |
| Auto-Start ROM Package (for Apple II only) | A2M0027 | 65.00 |
| Clock/Calendar Card | A2M0024 | 199.00 |
| Disk II — Drive & Controller (32K RAM required) | A2M0004 | 595.00 |
| Disk II — Drive Only | A2M0003 | 495.00 |
| Graphics Tablet (48K RAM/Applesoft Disk II required) | A2M0029 ^[2] | 795.00 |

| Description | Model No. | Suggested Retail Price |
|--|------------------------|------------------------------|
| ACCESSORIES (continued) | | |
| Memory Expansion Module — 16K | A2M0016 ^[4] | 160.00 |
| MODEM IIB Only | A2M0021 | 199.95 |
| MODEM IIB with Interface | A2M0017 | 390.00 |
| Printer II — Centronics Micro P1 & Controller | A2M0010 | 695.00 |
| Printer IIA — Centronics 779 Tractor/ Controller with 90 Day Warranty | A2M0011 | 1545.00 |
| Programmer's Aid #1 ROM (use with Integer BASIC) | A2M0019 | 50.00 |
| Tape Recorder | A2M0018 | 40.00 |
| Video Monitor-II (B & W) | A2M0005 | 240.00 |
| Vinyl Carrying Case | A2M0009 | 30.00 |
| TAPES AND DISKETTES | | |
| Apple Post (mailing list system) | A2D0013 | 49.95 |
| Applesoft II Language & Demo Cassette | A2T0004 | 20.00 |
| Appletrek/Space Wars Cassette | A2T0002 | 15.00 |
| Blank Cassettes | A2T0000 | 3.50 |
| Blank Diskettes (box of 10) | A2D0000 | 50.00 |
| Bowling Program Diskette | A2D0018 | 15.00 |
| Bowling Program Tape | A2T0015 | 15.00 |
| Centronics Micro P1 Paper | A2C0000 | 4.00 |
| Checkbook Cassette | A2T0001 | 20.00 |
| Color Demo/Breakout Cassette | A2T0003 | 7.50 |
| Datamover/Telepong (com. card & MODEM required) | A2T0012 | 7.50 |
| Disk Utility Pack with DOS 3.2.1 | A2D0010 ^[2] | 25.00 |
| Dow Jones Portfolio Evaluator | A2D0007 | 50.00 |
| Education Series — The Shell Games | A2D0014 ^[2] | 29.95 |
| Finance I-2 Package | A2T0011 | 25.00 |
| Microchess 2.0 Chess Disk | A2D0009 | 25.00 |
| Microchess 2.0 Chess Tape | A2T0013 | 20.00 |
| PASCAL with Language System (48K & disk required) | A2B0006 | 495.00 |
| RAM Test Tape with Manual | A2T0006 | 7.50 |
| The Cashier (retail store management) | A2D0025 | 250.00 |
| The Controller (general business system) | A2D0012 | 625.00 |
| PARAPHERNALIA | | |
| Desk | A2M0034 | 220.00 |
| Desk Return | A2M0035 | 130.00 |
| Diskette Holder Pages — Vinyl (package of 10) | A2G0001 | 8.50 |
| Extended Warranty Package | A2G0003 ^[2] | 195.00 |
| T-Shirt with Apple Logo | A2G0000 | 6.00 |

NOTES:

1. Price change.
2. New product introduction.
3. Prices and specifications subject to change without notice. Freight and dealer set-up charges not included.
4. Memory Expansion Module includes 8 RAMs, RAM Test Tape and Instructions.



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